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(54) **INHERENTLY SAFE IN SITU URANIUM RECOVERY**

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(58) **Field of Classification Search**  
 None  
 See application file for complete search history.

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(57) **ABSTRACT**

An in situ recovery of uranium operation involves circulating reactive fluids through an underground uranium deposit. These fluids contain chemicals that dissolve the uranium ore. Uranium is recovered from the fluids after they are pumped back to the surface. Chemicals used to accomplish this include complexing agents that are organic, readily degradable, and/or have a predictable lifetime in an aquifer. Efficiency is increased through development of organic agents targeted to complexing tetravalent uranium rather than hexavalent uranium. The operation provides for in situ immobilization of some oxy-anion pollutants under oxidizing conditions as well as reducing conditions. The operation also artificially reestablishes reducing conditions on the aquifer after uranium recovery is completed. With the ability to have the impacted aquifer reliably remediated, the uranium recovery operation can be considered inherently safe.

**13 Claims, 2 Drawing Sheets**

